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CASE REPORT

Fluoroscopic-controlled, arthroscopic removal of intra-articular broken wire after patellar fracture

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Introduction

Wiring of patellar fractures is a common treatment.[8] Breakage of the wires is not unusual, but the wire pieces usually remain extra-articular around the knee joint. Intra-articular migration of a wire piece is uncommon; Chen et al. reported one case which was managed by open retrieval.[1] Arthroscopic retrieval would be better for the patient,[2,4,6,7] but searching for a small foreign body in the knee joint is not an easy task, especially as hypertrophic synovial tissue usually envelops the object.[3,5,9] For radioopaque substances, an image intensifier enables exact location.[9] We report two cases of intra-articular wire pieces which were successfully removed with simultaneous use of arthroscopy and image intensifier.

Case reports

Case 1

A 32-year-old man presented with progressive medial right knee pain. He had sustained a patellar fracture at the age of 18 years which had been treated with circumferential wiring. Physical examination demonstrated right knee swelling and the pain was exacerbated by applying a varus force to the knee. Sixty millilitres of clear fluid was aspirated. Radiographs showed broken wires around the patella, with some pieces in the medial and posterior knee (Fig. 1). Magnetic resonance imaging (MRI) of the knee joint confirmed the wire piece was inside the joint, above the medial meniscus, and enclosed by synovial tissue (Fig. 2).

The patient underwent arthroscopy the following day. With the aid of an image intensifier, the small wire piece was precisely located using a probe through an anteromedial portal (Fig. 3). Removing the overlying synovial tissue with a power shaver exposed the wire which was retrieved arthroscopically (Fig. 4). The patient made a good recovery and was discharged the next day.

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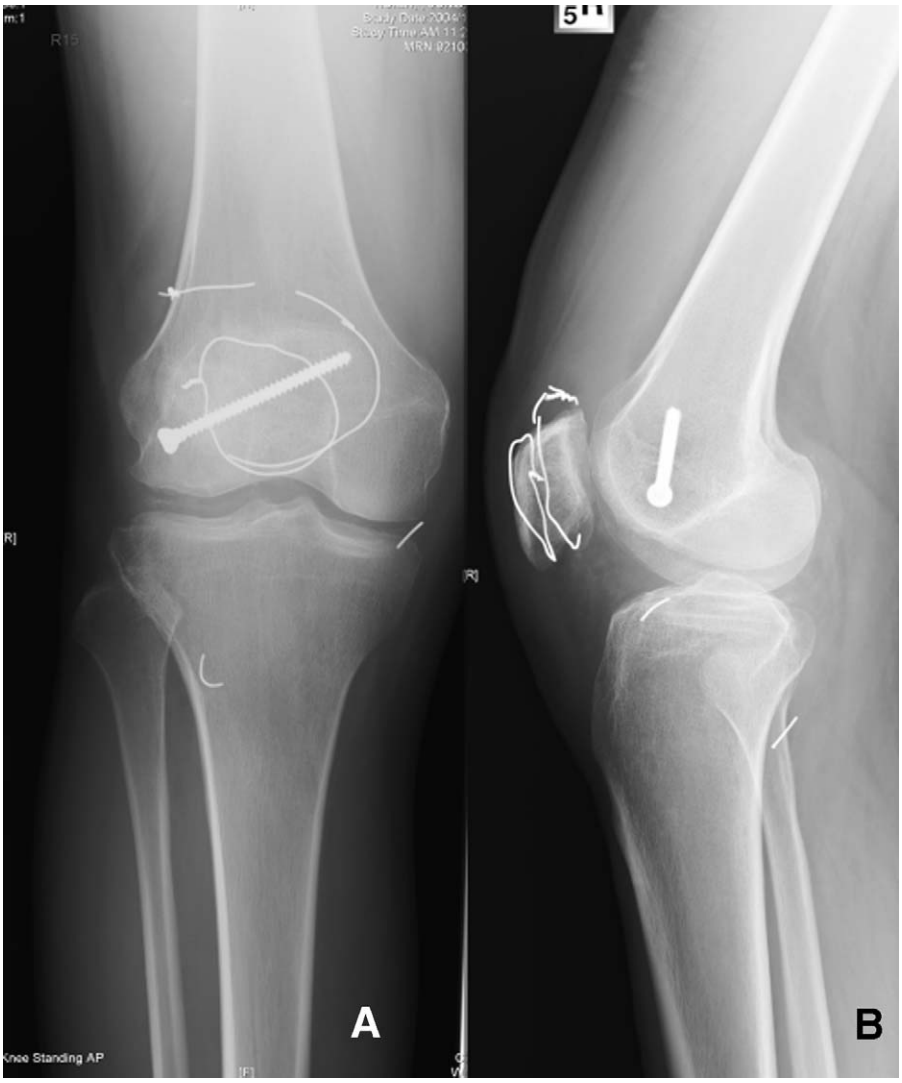

Figure 1 Radiograph of the left knee showing a broken circumferential wire with migrated wire pieces. The piece of wire over the medial compartment was thought to be in the knee joint. (A) Anterioposterior view. (B) Lateral view.

Case 2

A 42-year-old woman had a sudden onset of left knee swelling and stiffness 3 months after fixation of a patellar fracture. She was afebrile and there was no local erythematous change or tenderness around the knee. Radiographs showed an intra-articular migrated Kirschner wire in the retro-patellar space (Fig. 5). At arthroscopy there was hypertrophic synovial tissue over the corresponding area. After precisely locating the wire piece with image intensifier, the surrounding synovial tissue was carefully debrided to enable arthroscopic retrieval. The patient recovered uneventfully and was discharged the next day.

Discussion

The presentation of late painful knee effusion after surgical fixation of a patellar fracture is unusual. When radiographs demonstrate a broken wire, it is important to determine whether or not the wire piece is inside the joint. MRI identifies the precise location, and also shows soft tissue enclosure of the wire and any accompanying injuries. Use of an image intensifier in removing an intra-articular sewing needle through a mini-arthrotomy has been reported.[9] We used an image intensifier during arthroscopic probing to exactly locate the wires which had been enveloped by synovial tissue. This allowed us to expose the wire piece with a shaver

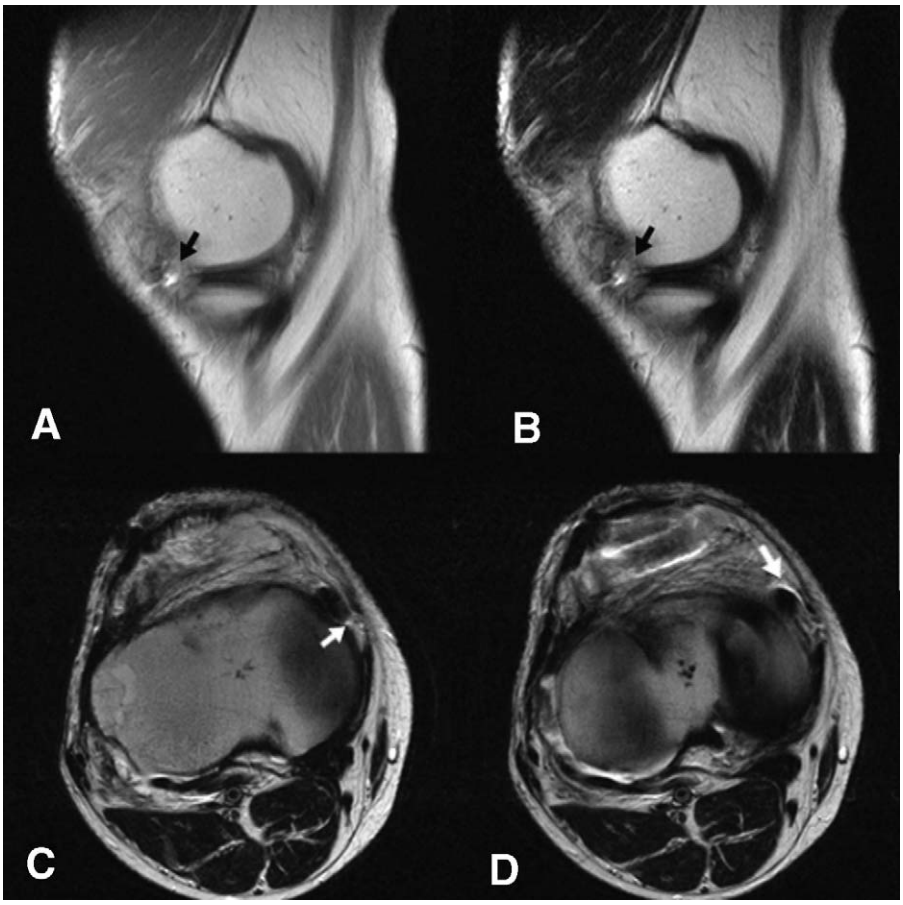

Figure 2 MRI confirmed the wire was located inside the knee joint above the medial meniscus. The soft tissue surrounding of the wire was demonstrated. (A) and (B) Sagittal section over medial knee. (C) and (D) Coronal section at meniscus level. Arrow: wire piece enclosed by soft tissue.

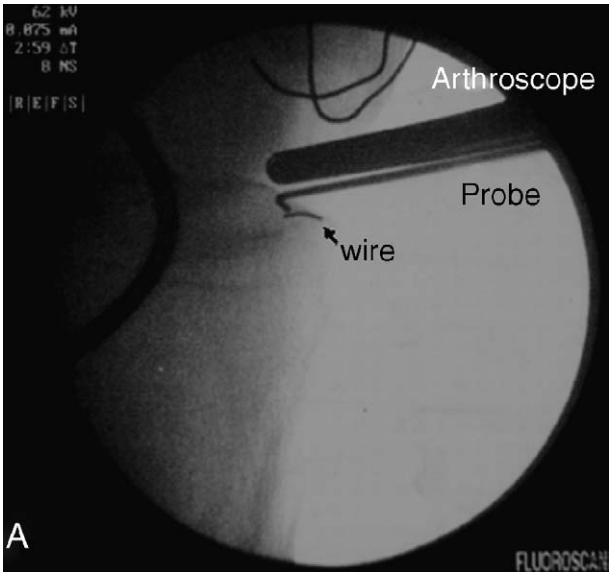

Figure 3 Under intraoperative image intensifier, the arthroscopic probe could precisely locate the wires despite overlying synovial tissue.

Figure 4 Arthroscopic view through anterolateral portal demonstrated the wire after shaving of the surrounding synovial tissue.

Figure 5 Radiograph of the left knee showed the migrated wire in the retropatellar space. (A) Anteroposterior view. (B) Lateral view.

perform an arthroscopic removal, with minimal violation of the knee joint.

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